Course report 2023

National 5 Applications of Mathematics

This report provides information on candidates' performance. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report is intended to be constructive and informative, and to promote better understanding. You should read the report in conjunction with the published assessment documents and marking instructions.

The statistics in the report were compiled before any appeals were completed.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2022: 14,305

Number of resulted entries in 2023: 19,021

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	4,794	Percentage	25.2	Cumulative percentage	25.2	Minimum mark required	63
B	Number of candidates	3,402	Percentage	17.9	Cumulative percentage	43.1	Minimum mark required	52
C	Number of candidates	3,570	Percentage	18.8	Cumulative percentage	61.9	Minimum mark required	41
D	Number of candidates	3,279	Percentage	17.2	Cumulative percentage	79.1	Minimum mark required	30
No award	Number of candidates	3,976	Percentage	20.9	Cumulative percentage	100	Minimum mark required	N/A

Please note that rounding has not been applied to these statistics.

You can read the general commentary on grade boundaries in the appendix.

In this report:

- ‘most’ means greater than 70%
- ‘many’ means 50% to 69%
- ‘some’ means 25% to 49%
- ‘a few’ means less than 25%

You can find more statistical reports on the statistics and information page of SQA’s website.

Section 1: comments on the assessment

The course assessment was accessible to most candidates. Feedback suggests it gave candidates a good opportunity to demonstrate the spread and depth of their knowledge.

The question papers largely performed as expected, but the overall level of demand was slightly higher than intended. The grade boundaries were adjusted to take account of this.

Question paper 1 (non-calculator)

Overall, this paper performed as expected and most candidates were able to attempt all of the questions. However, questions 5 and 12 proved more challenging than expected.

Poor basic number skills resulted in many candidates not gaining marks in some questions.

Question paper 2

This paper mostly performed as expected. However, questions 2, 4, 6(c), and 7(e)(ii) proved more challenging than expected.

Section 2: comments on candidate performance

Question paper 1 (non-calculator)

Question 2: reading scales with minor unmarked divisions

Most candidates successfully marked the speed on the miles per hour scale. However, many candidates did not gain the second mark as they misinterpreted the kilometres per hour scale.

Question 3: adding and subtracting fractions

Most candidates made a good attempt at this question.

Question 5: probability

Many candidates calculated the probability of not winning on both spinners but did not progress beyond that step. Fewer candidates than in previous years attempted to complete a table to calculate the probability.

Question 9: gradient and tolerance

Most candidates calculated the gradient, although many did not deal with the difference in units. Many candidates made no attempt to calculate the upper and lower limits. Many candidates did not correctly convert the gradient into a decimal to make a numerical comparison.

Question 12: calculating best value

Few candidates attempted the strategy of dividing by 7 and 9 to find the cost of five kiwis. Many candidates attempted to divide by 35 and 45 but did not complete the calculations.

Question paper 2

Question 1: calculating a compound percentage

Most candidates were able to apply an appropriate strategy to calculate the answer. Many candidates used a year-by-year approach rather than the multiplier and power strategy.

Question 2: perimeter involving quarter circles

Many candidates were unable to differentiate between calculating a circumference and calculating an area. Many candidates incorrectly used the radius to attempt the calculation of the circumference. Most candidates were unable to subtract the two radii to calculate the length of the straight edge on top of the shape.

Question 3: Pythagoras' theorem

Most candidates identified Pythagoras' theorem as the correct strategy to use in this question. Some candidates added in the second Pythagoras calculation.

Question 4: area of a composite shape

Many candidates were unable to differentiate between calculating a circumference and calculating an area. Many candidates incorrectly used the diameter to attempt the calculation of the area of a circle. Some candidates were unable to calculate the area of a square.

Question 5(b): comparing calculated statistics

Few candidates were able to successfully compare calculated statistics. Comments like, ‘on average Colin’s hot tub was more varied’ were common.

Question 5(c): inverse proportion

Many candidates attempted to use direct proportion to answer this question.

Question 6(c): calculating the volume of a compound solid

Many candidates were unable to successfully substitute into the formula for volume of a sphere. Many candidates were unable to calculate the volume of a cube. Some candidates did not achieve the final mark due to incorrect units.

Question 7(d)(ii): comparing calculated statistics

Most candidates were unable to successfully compare interquartile ranges.

Question 7(e)(i): calculating National Insurance

Most candidates were unable to successfully calculate the National Insurance contribution as a result of the salary extending into the 3.25% band.

Question 7(e)(ii): calculating net pay

Many candidates were unable to correctly calculate the pension contribution, often because they subtracted the National Insurance payment first.

Question 8(c): calculating arrival time, including a time difference

Many candidates were unable to correctly deal with the different time zones.

Many candidates were unable to successfully convert 90 hours into days and hours.

Section 3: preparing candidates for future assessment

The following advice may help prepare future candidates for the National 5 Applications of Mathematics question papers:

- Maintain and practise number skills to prepare candidates for the non-calculator question paper. In paper 1, performance in number skills was disappointing and cost many candidates valuable marks.
- Practise questions that require candidates to communicate a reason or an explanation. Many candidates still cannot compare data sets appropriately. Candidates should know that a numerical comparison is required in this type of statement.
- Candidates should be able to calculate the circumference of a circle and the area of a circle and not confuse the formulae.
- Encourage candidates to use the formulae list.
- Practise working with probability and expected frequency.
- Practise calculating gross pay, income tax, National Insurance, and net pay.
- Candidates should understand the difference between direct and inverse proportion.

Appendix: general commentary on grade boundaries

SQA's main aim when setting grade boundaries is to be fair to candidates across all subjects and levels and maintain comparable standards across the years, even as arrangements evolve and change.

For most National Courses, SQA aims to set examinations and other external assessments and create marking instructions that allow:

- a competent candidate to score a minimum of 50% of the available marks (the notional grade C boundary)
- a well-prepared, very competent candidate to score at least 70% of the available marks (the notional grade A boundary)

It is very challenging to get the standard on target every year, in every subject at every level. Therefore, SQA holds a grade boundary meeting for each course to bring together all the information available (statistical and qualitative) and to make final decisions on grade boundaries based on this information. Members of SQA's Executive Management Team normally chair these meetings.

Principal assessors utilise their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. SQA can adjust the grade boundaries as a result of the discussion at these meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper or other assessment has been more, or less, difficult than usual.

- The grade boundaries can be adjusted downwards if there is evidence that the question paper or other assessment has been more difficult than usual.
- The grade boundaries can be adjusted upwards if there is evidence that the question paper or other assessment has been less difficult than usual.
- Where levels of difficulty are comparable to previous years, similar grade boundaries are maintained.

Grade boundaries from question papers in the same subject at the same level tend to be marginally different year on year. This is because the specific questions, and the mix of questions, are different and this has an impact on candidate performance.

This year, a package of support measures was developed to support learners and centres. This included modifications to course assessment, retained from the 2021–22 session. This support was designed to address the ongoing disruption to learning and teaching that young people have experienced as a result of the COVID-19 pandemic while recognising a lessening of the impact of disruption to learning and teaching as a result of the pandemic. The revision support that was available for the 2021–22 session was not offered to learners in 2022–23.

In addition, SQA adopted a sensitive approach to grading for National 5, Higher and Advanced Higher courses, to help ensure fairness for candidates while maintaining

standards. This is in recognition of the fact that those preparing for and sitting exams continue to do so in different circumstances from those who sat exams in 2019 and 2022.

The key difference this year is that decisions about where the grade boundaries have been set have also been influenced, where necessary and where appropriate, by the unique circumstances in 2023 and the ongoing impact the disruption from the pandemic has had on learners. On a course-by-course basis, SQA has determined grade boundaries in a way that is fair to candidates, taking into account how the assessment (exams and coursework) has functioned and the impact of assessment modifications and the removal of revision support.

The grade boundaries used in 2023 relate to the specific experience of this year's cohort and should not be used by centres if these assessments are used in the future for exam preparation.

For full details of the approach please refer to the National Qualifications 2023 Awarding — Methodology Report.